

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference SUROS-003-20	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 01/ 51235	International filing date (day/month/year) 25/10/2001	(Earliest) Priority Date (day/month/year) 06/11/2000
Applicant SUROS SURGICAL SYSTEMS, INC.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 8 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

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☐ None of the figures.

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International application No.
PCT/US 01/51235

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: **80**
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-37

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-37

PROBLEM : powering a tissue cutting device; SOLUTION : an inner and an outer cannula, a first hydraulic rotary motor, a second hydraulic reciprocating motor and a hydraulic system;

2. Claims: 38-41

PROBLEM : blunting of a tissue cutting device; SOLUTION : an inner and an outer cannula, a motor assembly and a cutting board;

3. Claims: 42-45

PROBLEM : cutting ability of a cannula; SOLUTION : at least one tooth;

4. Claims: 46-51

PROBLEM : rigidity of a cannula; SOLUTION : stiffening member;

5. Claims: 52-53

PROBLEM : surface structure of a cannula; SOLUTION : a dimple;

6. Claims: 54-60

PROBLEM : driving a cannula in two different directions a tissue cutting device; SOLUTION : an inner and an outer cannula, a first motor to move said inner cannula in a first direction, means for supporting said first motor for movement with said inner cannula in a second direction different from said first direction; and a second motor operably coupled to said means for supporting to move said first motor, and thereby said inner cannula, in said second direction while said first motor moves said inner cannula in said first direction;

7. Claims: 61-63

PROBLEM : a tissue cutting device which can be disassembled; SOLUTION : an outer cannula, a cutting member, a hand piece, a vacuum source and a hub attached to said outer cannula and

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

detachably mounted to said hand piece to permit separation of said outer cannula from said hand piece and said cutting member;

8. Claims: 64-66

PROBLEM : air flow in a tissue cutting device; SOLUTION : an outer cannula, a cutting member, a hand piece, a vacuum source and a hub defining a leak path between said outer lumen of said outer cannula and atmospheric air when said distal end of said outer cannula is disposed within a body and said hub is disposed outside the body;

9. Claim : 67

PROBLEM : drive system for a tissue cutting device for impact cutting of tissue; SOLUTION : an outer and an inner cannula, a cutting board, a piston with a return spring, a source of pressurised fluid, and a pressure switch coupled to said source of pressurised fluid to switch as a function of the magnitude of the fluid pressure within said cylinder;

10. Claims: 68-69

PROBLEM : drive system for a tissue cutting device for severing tissue under pressure; SOLUTION : an outer and an inner cannula, a cutting board, a hydraulic reciprocating motor and a hydraulic system connecting said hydraulic motor to a source of pressurised fluid to provide a substantially constant fluid pressure to said motor as said motor advances said inner cannula;

11. Claims: 70-76

PROBLEM : MRI compatible tissue cutting device; SOLUTION : an outer and an inner cannula and a drive mechanism operably coupled to said inner cannula to move said inner cannula relative to said tissue-receiving opening in said outer cannula, wherein said drive mechanism is substantially composed of a non-metallic material;

12. Claims: 77-79

PROBLEM : connecting a fluid connection tube to a tissue cutting device; SOLUTION : an elongated hand piece defining an elongated channel on an outer surface of said hand piece, a cannula hub mounted to said hand piece and having a fluid port, a tube connected at one end to said fluid port and having an opposite end connectable to a fluid source, said tube disposed within said elongated channel and sized to be

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

recessed within said channel relative to said outer surface, an outer cannula and an inner cutting member;

13. Claims: 81-82

PROBLEM : retrieval of severed tissue from a tissue cutting device; SOLUTION : an outer and an inner cannula, a motor assembly for rotating and reciprocating said inner cannula, a vacuum source fluidly coupled to said inner cannula for generating a vacuum in said lumen of said inner cannula to draw severed tissue there through; and a tissue collection chamber interposed between said vacuum source and said open opposite end of said inner cannula to receive severed tissue drawn into said chamber by the vacuum;

14. Claim : 83

PROBLEM : mounting arrangement for the rotary motor in a tissue cutting device; SOLUTION : an outer and an inner cannula, a reciprocating motor for translating a rotary motor and thereby translate said inner cannula within said outer cannula while said inner cannula rotates, a hand piece supporting said rotary motor and said reciprocating motor, said hand piece including a pair of opposite rails, wherein said rotary motor includes a pair of opposite outwardly projecting wings configured to be slidably supported on said opposite rails to resist rotation of said rotary motor while permitting said rotary motor to translate relative to said rails;

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61B10/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 526 822 A (BURBANK FRED H ET AL) 18 June 1996 (1996-06-18) column 13, line 3 - line 56 column 13, line 50 - line 56 column 14, line 40 - line 43 column 14, line 59 - line 67 column 18, line 9 - line 46 column 19, line 6 - line 22 figures 2,3,6,13,15 ---	1-37
Y	US 5 669 923 A (GORDON MARK G) 23 September 1997 (1997-09-23) column 2, line 51 - line 53 column 15, line 20 - line 23 figures 5-16 --- -/--	1-37

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

14 August 2002

Date of mailing of the international search report

10.12.02

Name and mailing address of the ISA

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Authorized officer

Bridge, S

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/51235

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 848 978 A (CECCHI MICHAEL) 15 December 1998 (1998-12-15) column 4, line 32 - line 34 ---	1-37
A	US 5 794 626 A (KIETURAKIS MACIEJ J) 18 August 1998 (1998-08-18) column 6, line 53 - line 54 ---	1-37
A	US 3 401 684 A (DREMANN JULES M) 17 September 1968 (1968-09-17) the whole document -----	1-37

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/51235

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5526822	A	18-06-1996	CA 2186283 A1 EP 0751744 A1 JP 9510638 T US 5928164 A US 5980469 A WO 9525465 A2 US 2002120212 A1 US 5649547 A US 5775333 A US 2001007925 A1 US 2002016555 A1	28-09-1995 08-01-1997 28-10-1997 27-07-1999 09-11-1999 28-09-1995 29-08-2002 22-07-1997 07-07-1998 12-07-2001 07-02-2002
US 5669923	A	23-09-1997	AU 1844397 A CA 2244072 A1 EP 0955913 A1 JP 2000503869 T WO 9726835 A1 US 5827305 A US 5792166 A	20-08-1997 31-07-1997 17-11-1999 04-04-2000 31-07-1997 27-10-1998 11-08-1998
US 5848978	A	15-12-1998	NONE	
US 5794626	A	18-08-1998	US 6387056 B1	14-05-2002
US 3401684	A	17-09-1968	NONE	

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.